

SEQUENCE LISTING

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     Metzker, Michael L.
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<150> 60/129,274 <151> 1999-04-14

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gttctcagcc aaaaccagtg atagatgctg acacagccct tggcactgat gatgtatatg 1380
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Leu Glu Arg Pro Arg Gly Trp Ala Phe Ile Tyr His Ala Phe Val Phe
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                                                45
Leu Leu Val Phe Gly Cys Leu Ile Leu Ser Val Phe Ser Thr Ile Pro
                        55
                                            60
Glu His Thr Lys Leu Ala Ser Ser Cys Leu Leu Ile Leu Glu Phe Val
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Met Ile Val Val Phe Gly Leu Glu Phe Ile Ile Arg Ile Trp Ser Ala
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Gly Cys Cys Cys Arg Tyr Arg Gly Trp Gln Gly Arg Leu Arg Phe Ala
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Arg Lys Pro Phe Cys Val Ile Asp Thr Ile Val Leu Ile Ala Ser Ile
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Ala Val Val Ser Ala Lys Thr Gln Gly Asn Ile Phe Ala Thr Ser Ala
                       135
                                           140
Leu Arg Ser Leu Arg Phe Leu Gln Ile Leu Arg Met Val Arg Met Asp
                   150
                                       155
Arg Arg Gly Gly Thr Trp Lys Leu Leu Gly Ser Val Val Tyr Ala His
                                   170
Ser Lys Glu Leu Ile Thr Ala Trp Tyr Ile Gly Phe Leu Val Leu Ile
                               185
Phe Ser Ser Phe Leu Val Tyr Leu Val Glu Lys Asp Ala Asn Lys Glu
                            200
Phe Ser Thr Tyr Ala Asp Ala Leu Trp Trp Gly Thr Ile Thr Leu Thr
                       215
Thr Ile Gly Tyr Gly Asp Lys Thr Pro Leu Thr Trp Leu Gly Arg Leu
                                        235
                   230
Leu Ser Ala Gly Phe Ala Leu Leu Gly Ile Ser Phe Phe Ala Leu Pro
                245
                                    250
Ala Gly Ile Leu Gly Ser Gly Phe Ala Leu Lys Val Gln Glu Gln His
            260
                                265
Arg Gln Lys His Phe Glu Lys Arg Arg Asn Pro Ala Ala Asn Leu Ile
        275
                            280
                                                285
Gln Cys Val Trp Arg Ser Tyr Ala Ala Asp Glu Lys Ser Val Ser Ile
                        295
                                            300
Ala Thr Trp Lys Pro His Leu Lys Ala Leu His Thr Cys Ser Pro Thr
                    310
                                        315
Lys Lys Glu Gln Gly Glu Ala Ser Ser Gln Lys Leu Ser Phe Lys
                325
                                    330
Glu Arg Val Arg Met Ala Ser Pro Arg Gly Gln Ser Ile Lys Ser Arg
            340
                                345
Gln Ala Ser Val Gly Asp Arg Arg Ser Pro Ser Thr Asp Ile Thr Ala
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Glu Gly Ser Pro Thr Lys Val Gln Lys Ser Trp Ser Phe Asn Asp Arg
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Thr Arg Phe Arg Pro Ser Leu Arg Leu Lys Ser Ser Gln Pro Lys Pro
                    390
Val Ile Asp Ala Asp Thr Ala Leu Gly Thr Asp Asp Val Tyr Asp Glu
                405
                                    410
Lys Gly Cys Gln Cys Asp Val Ser Val Glu Asp Leu Thr Pro Pro Leu
                                425
Lys Thr Val Ile Arg Ala Ile Arg Ile Met Lys Phe His Val Ala Lys
                            440
Arg Lys Phe Lys Glu Thr Leu Arg Pro Tyr Asp Val Lys Asp Val Ile
                        455
Glu Gln Tyr Ser Ala Gly His Leu Asp Met Leu Cys Arg Ile Lys Ser
                    470
                                        475
Leu Gln Thr Arg Val Asp Gln Ile Leu Gly Lys Gly Gln Ile Thr Ser
                485
                                    490
Asp Lys Lys Ser Arg Glu Lys Ile Thr Ala Glu His Glu Thr Thr Asp
                                505
Asp Leu Ser Met Leu Gly Arg Val Val Lys Val Glu Lys Gln Val Gln
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                                                525
Ser Ile Glu Ser Lys Leu Asp Cys Leu Leu Asp Ile Tyr Gln Gln Val
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Leu Arg Lys Gly Ser Ala Ser Ala Leu Ala Leu Ala Ser Phe Gln Ile
                   550
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Pro Pro Phe Glu Cys Glu Gln Thr Ser Asp Tyr Gln Ser Pro Val Asp
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Ser Lys Asp Leu Ser Gly Ser Ala Gln Asn Ser Gly Cys Leu Ser Arg
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Ser Thr Ser Ala Asn Ile Ser Arg Gly Leu Gln Phe Ile Leu Thr Pro
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Asn Glu Phe Ser Ala Gln Thr Phe Tyr Ala Leu Ser Pro Thr Met His
                        615
                                            620
Ser Gln Ala Thr Gln Val Pro Ile Ser Gln Ser Asp Gly Ser Ala Val
                    630
                                        635
Ala Ala Thr Asn Thr Ile Ala Asn Gln Ile Asn Thr Ala Pro Lys Pro
                645
                                    650
Ala Ala Pro Thr Thr Leu Gln Ile Pro Pro Pro Leu Pro Ala Ile Lys
            660
                                665
                                                     670
His Leu Pro Arg Pro Glu Thr Leu His Pro Asn Pro Ala Gly Leu Gln
                            680
                                                685
Glu Ser Ile Ser Asp Val Thr Thr Cys Leu Val Ala Ser Lys Glu Asn
                        695
                                            700
Val Gln Val Ala Gln Ser Asn Leu Thr Lys Asp Arg Ser Met Arg Lys
                    710
                                        715
Ser Phe Asp Met Gly Gly Glu Thr Leu Leu Ser Val Cys Pro Met Val
                725
                                    730
Pro Lys Asp Leu Gly Lys Ser Leu Ser Val Gln Asn Leu Ile Arg Ser
            740
                                745
Thr Glu Glu Leu Asn Ile Gln Leu Ser Gly Ser Glu Ser Ser Ala Ser
                            760
Arg Gly Ser Gln Asp Phe Tyr Pro Lys Trp Arg Glu Ser Lys Leu Phe
                        775
                                            780
Ile Thr Asp Glu Glu Val Gly Pro Glu Glu Thr Glu Thr Asp Thr Phe
                    790
                                        795
Asp Ala Ala Pro Gln Pro Ala Arg Glu Ala Ala Phe Ala Ser Asp Ser
                805
                                    810
Leu Arg Thr Gly Arg Ser Arg Ser Ser Gln Ser Ile Cys Lys Ala Gly
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Glu Ser Thr Asp Ala Leu Ser Leu Pro His Val Lys Leu Lys
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                            840
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<212> PRT <213> Homo Sapiens

<400> 4

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 30

 Gln Gly Glu Ala Gly Gly Gly Gly Ser Pro Arg Arg Leu Gly Leu Leu 35
 40
 45

 Gly Ser Pro Leu Pro Pro Gly Ala Pro Leu Pro Gly Pro Gly Ser Gly 50
 55
 60

 Ser Gly Ser Ala Cys Gly Gln Arg Ser Ser Ala Ala His Lys Arg Tyr 65
 70
 75
 80

 Arg Arg Leu Gln Asn Trp Val Tyr Asn Val Leu Glu Arg Pro Arg Gly

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85
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Trp Ala Phe Val Tyr His Val Phe Ile Phe Leu Leu Val Phe Ser Cys
                                105
Leu Val Leu Ser Val Leu Ser Thr Ile Gln Glu His Gln Glu Leu Ala
                            120
                                                125
Asn Glu Cys Leu Leu Ile Leu Glu Phe Val Met Ile Val Val Phe Gly
                        135
Leu Glu Tyr Ile Val Arg Val Trp Ser Ala Gly Cys Cys Cys Arg Tyr
                   150
                                        155
Arg Gly Trp Gln Gly Arg Phe Arg Phe Ala Arg Lys Pro Phe Cys Val
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                                    170
Ile Asp Phe Ile Val Phe Val Ala Ser Val Ala Val Ile Ala Ala Gly
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Thr Gln Gly Asn Ile Phe Ala Thr Ser Ala Leu Arg Ser Met Arg Phe
                            200
Leu Gln Ile Leu Arg Met Val Arg Met Asp Arg Arg Gly Gly Thr Trp
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                                            220
Lys Leu Leu Gly Ser Val Val Tyr Ala His Ser Lys Glu Leu Ile Thr
225
                    230
                                        235
Ala Trp Tyr Ile Gly Phe Leu Val Leu Ile Phe Ala Ser Phe Leu Val
                245
                                    250
Tyr Leu Ala Glu Lys Asp Ala Asn Ser Asp Phe Ser Ser Tyr Ala Asp
                                265
Ser Leu Trp Trp Gly Thr Ile Thr Leu Thr Thr Ile Gly Tyr Gly Asp
                            280
Lys Thr Pro His Thr Trp Leu Gly Arg Val Leu Ala Ala Gly Phe Ala
                        295
Leu Leu Gly Ile Ser Phe Phe Ala Leu Pro Ala Gly Ile Leu Gly Ser
                    310
                                        315
Gly Phe Ala Leu Lys Val Gln Glu Gln His Arg Gln Lys His Phe Glu
                325
                                    330
Lys Arg Arg Met Pro Ala Ala Asn Leu Ile Gln Ala Ala Trp Arg Leu
                                345
Tyr Ser Thr Asp Met Ser Arg Ala Tyr Leu Thr Ala Thr Trp Tyr Tyr
                            360
Tyr Asp Ser Ile Leu Pro Ser Phe Arg Glu Leu Ala Leu Leu Phe Glu
                        375
His Val Gln Arg Ala Arg Asn Gly Gly Leu Arg Pro Leu Glu Val Arg
                    390
                                        395
Arg Ala Pro Val Pro Asp Gly Ala Pro Ser Arg Tyr Pro Pro Val Ala
                405
                                    410
Thr Cys His Arg Pro Gly Ser Thr Ser Phe Cys Pro Gly Glu Ser Ser
            420
                                425
Arg Met Gly Ile Lys Asp Arg Ile Arg Met Gly Ser Ser Gln Arg Arg
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                            440
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Thr Gly Pro Ser Lys Gln Gln Leu Ala Pro Pro Thr Met Pro Thr Ser
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Pro Ser Ser Glu Gln Val Gly Glu Ala Thr Ser Pro Thr Lys Val Gln
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Lys Ser Trp Ser Phe Asn Asp Arg Thr Arg Phe Arg Ala Ser Leu Arg
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                                    490
Leu Lys Pro Arg Thr Ser Ala Glu Asp Ala Pro Ser Glu Glu Val Ala
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                                505
Glu Glu Lys Ser Tyr Gln Cys Glu Leu Thr Val Asp Asp Ile Met Pro
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                            520
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Ala Val Lys Thr Val Ile Arg Ser Ile Arg Ile Leu Lys Phe Leu Val
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Ala Lys Arg Lys Phe Lys Glu Thr Leu Arg Pro Tyr Asp Val Lys Asp
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Val Ile Glu Gln Tyr Ser Ala Gly His Leu Asp Met Leu Gly Arg Ile
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Lys Ser Leu Gln Thr Arg Val Asp Gln Ile Val Gly Arg Gly Pro Gly
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Asp Arg Lys Ala Arg Glu Lys Gly Asp Lys Gly Pro Ser Asp Ala Glu
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Val Val Asp Glu Ile Ser Met Met Gly Arg Val Val Lys Val Glu Lys
                        615
                                            620
Gln Val Gln Ser Ile Glu His Lys Leu Asp Leu Leu Gly Phe Tyr
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Ser Arg Cys Leu Arg Ser Gly Thr Ser Ala Ser Leu Gly Ala Val Gln
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Val Pro Leu Phe Asp Pro Asp Ile Thr Ser Asp Tyr His Ser Pro Val
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Asp His Glu Asp Ile Ser Val Ser Ala Gln Thr Leu Ser Ile Ser Arg
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Ser Val Ser Thr Asn Met Asp
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Asn Tyr Asn Val Leu Glu Arg Pro Arg Gly Trp Ala Phe Tyr His Phe
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Phe Leu Leu Val Phe Cys Leu Leu Ser Val Ser Thr Ile Glu His Leu
Ala Cys Leu Leu Ile Leu Glu Phe Val Met Ile Val Val Phe Gly Leu
Glu Ile Arg Trp Ser Ala Gly Cys Cys Cys Arg Tyr Arg Gly Trp Gln
                                        75
Gly Arg Arg Phe Ala Arg Lys Pro Phe Cys Val Ile Asp Ile Val Ala
                                    90
Ser Ala Val Ala Thr Gln Gly Asn Ile Phe Ala Thr Ser Ala Leu Arg
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Ser Arg Phe Leu Gln Ile Leu Arg Met Val Arg Met Asp Arg Arg Gly 115 120 Gly Thr Trp Lys Leu Leu Gly Ser Val Val Tyr Ala His Ser Lys Glu 135 140 Leu Ile Thr Ala Trp Tyr Ile Gly Phe Leu Val Leu Ile Phe Ser Phe 150 155 Leu Val Tyr Leu Glu Lys Asp Ala Asn Phe Ser Tyr Ala Asp Leu Trp 170 165 Trp Gly Thr Ile Thr Leu Thr Thr Ile Gly Tyr Gly Asp Lys Thr Pro 185 190 Thr Trp Leu Gly Arg Leu Ala Gly Phe Ala Leu Leu Gly Ile Ser Phe 200 205 Phe Ala Leu Pro Ala Gly Ile Leu Gly Ser Gly Phe Ala Leu Lys Val 215 220 Gln Glu Gln His Arg Gln Lys His Phe Glu Lys Arg Arg Pro Ala Ala

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230
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Asn Leu Ile Gln Trp Arg Tyr Asp Ser Ala Thr Trp Leu Ala Leu Thr
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Cys Pro Thr Gly Glu Ser Ser Lys Arg Arg Met Ser Arg Gly Ser Lys
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                                                    270
Ala Ser Pro Ser Glu Ser Pro Thr Lys Val Gln Lys Ser Trp Ser Phe
                            280
Asn Asp Arg Thr Arg Phe Arg Ser Leu Arg Leu Lys Pro Ala Ala Val
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                                            300
Glu Lys Gln Cys Val Asp Pro Lys Thr Val Ile Arg Ile Arg Ile Lys
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                                        315
Phe Val Ala Lys Arg Lys Phe Lys Glu Thr Leu Arg Pro Tyr Asp Val
                325
                                    330
Lys Asp Val Ile Glu Gln Tyr Ser Ala Gly His Leu Asp Met Leu Arg
                                345
Ile Lys Ser Leu Gln Thr Arg Val Asp Gln Ile Gly Gly Asp Lys Arg
                            360
Glu Lys Glu Asp Ser Met Gly Arg Val Val Lys Val Glu Lys Gln Val
                        375
Gln Ser Ile Glu Lys Leu Asp Leu Leu Tyr Leu Arg Gly Ser Ala Ser
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Leu Gln Pro Phe Thr Ser Asp Tyr Ser Pro Val Asp Asp Ser Ser Ala
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Gln Ser Ser Arg Ser Ser Asn
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Asp Ser Thr Arg Asp Gly Ala Leu Leu Ile Ala Gly Ser Glu Ala Pro
                            40
Lys Arg Gly Ser Ile Leu Ser Lys Pro Arg Ala Gly Gly Ala Gly Ala
                        55
Gly Lys Pro Pro Lys Arg Asn Ala Phe Tyr Arg Lys Leu Gln Asn Phe
                   70
                                        75
Leu Tyr Asn Val Leu Glu Arg Pro Arg Gly Trp Ala Phe Ile Tyr His
               8.5
                                    90
Ala Tyr Val Phe Leu Leu Val Phe Ser Cys Leu Val Leu Ser Val Phe
                               105
Ser Thr Ile Lys Glu Tyr Glu Lys Ser Ser Glu Gly Ala Leu Tyr Ile
                            120
                                                125
Leu Glu Ile Val Thr Ile Val Val Phe Gly Val Glu Tyr Phe Val Arg
                       135
                                           140
Ile Trp Ala Ala Gly Cys Cys Cys Arg Tyr Arg Gly Trp Arg Gly Arg
                   150
                                       155
Leu Lys Phe Ala Arg Lys Pro Phe Cys Val Ile Asp Ile Met Val Leu
               165
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Ile Ala Ser Ile Ala Val Leu Ala Ala Gly Ser Gln Gly Asn Val Phe
180 185 190

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Ala Thr Ser Ala Leu Arg Ser Leu Arg Phe Leu Gln Ile Leu Arg Met
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Ile Arg Met Asp Arg Gly Gly Thr Trp Lys Leu Leu Gly Ser Val
                        215
                                            220
Val Tyr Ala His Ser Lys Glu Leu Val Thr Ala Trp Tyr Ile Gly Phe
                   230
                                        235
Leu Cys Leu Ile Leu Ala Ser Phe Leu Val Tyr Leu Ala Glu Lys Gly
                245
                                    250
Glu Asn Asp His Phe Asp Thr Tyr Ala Asp Ala Leu Trp Trp Gly Leu
                                265
Ile Thr Leu Thr Thr Ile Gly Tyr Gly Asp Lys Tyr Pro Gln Thr Trp
                            280
                                                285
Asn Gly Arg Leu Leu Ala Ala Thr Phe Thr Leu Ile Gly Val Ser Phe
                        295
                                            300
Phe Ala Leu Pro Ala Gly Ile Leu Gly Ser Gly Phe Ala Leu Lys Val
                    310
                                        315
Gln Glu Gln His Arg Gln Lys His Phe Glu Lys Arg Arg Asn Pro Ala
                325
                                    330
Ala Gly Leu Ile Gln Ser Ala Trp Arg Phe Tyr Ala Thr Asn Leu Ser
            340
                                345
Arg Thr Asp Leu His Ser Thr Trp Gln Tyr Tyr Glu Arg Thr Val Thr
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Val Pro Met Tyr Arg Leu Ile Pro Pro Leu Asn Gln Leu Glu Leu Leu
                        375
                                            380
Arg Asn Leu Lys Ser Lys Ser Gly Leu Ala Phe Arg Lys Asp Pro Pro
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                                        395
Pro Glu Pro Ser Pro Ser Gln Lys Val Ser Leu Lys Asp Arg Val Phe
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                                    410
Ser Ser Pro Arg Gly Val Ala Ala Lys Gly Lys Gly Ser Pro Gln Ala
            420
                                425
Gln Thr Val Arg Arg Ser Pro Ser Ala Asp Gln Ser Leu Glu Asp Ser
                            440
Pro Ser Lys Val Pro Lys Ser Trp Ser Phe Gly Asp Arg Ser Arg Ala
                        455
Arg Gln Ala Phe Arg Ile Lys Gly Ala Ala Ser Arg Gln Asn Ser Glu
                    470
                                        475
Glu Ala Ser Leu Pro Gly Glu Asp Ile Val Asp Asp Lys Ser Cys Pro
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Cys Glu Phe Val Thr Glu Asp Leu Thr Pro Gly Leu Lys Val Ser Ile
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Arg Ala
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<211> 521
<212> PRT
<213> Homo Sapiens
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<400> 7

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Ala Ala Ala Ala Ala Gly Asp Glu Glu Arg Lys Val Gly Leu Ala Pro Gly 35 40 40 45

Asp Val Glu Gln Val Thr Leu Ala Leu Gly Ala Gly Ala Asp Lys Asp

Gly Thr Leu Leu Glu Gly Gly Gly Arg Asp Glu Gly Gln Arg Arg Thr Pro Gln Gly Ile Gly Leu Leu Ala Lys Thr Pro Leu Ser Arg Pro Val Lys Arg Asn Asn Ala Lys Tyr Arg Arg Ile Gln Thr Leu Ile Tyr Asp Ala Leu Glu Arg Pro Arg Gly Trp Ala Leu Leu Tyr His Ala Leu Val Phe Leu Ile Val Leu Gly Cys Leu Ile Leu Ala Val Leu Thr Thr Phe Lys Glu Tyr Glu Thr Val Ser Gly Asp Trp Leu Leu Leu Glu Thr Phe Ala Ile Phe Ile Phe Gly Ala Glu Phe Ala Leu Arg Ile Trp Ala Ala Gly Cys Cys Cys Arg Tyr Lys Gly Trp Arg Gly Arg Leu Lys Phe Ala Arg Lys Pro Leu Cys Met Leu Asp Ile Phe Val Leu Ile Ala Ser Val Pro Val Val Ala Val Gly Asn Gln Gly Asn Val Leu Ala Thr Ser Leu Arg Ser Leu Arg Phe Leu Gln Ile Leu Arg Met Leu Arg Met Asp Arg Arg Gly Gly Thr Trp Lys Leu Leu Gly Ser Ala Ile Cys Ala His Ser Lys Glu Leu Ile Thr Ala Trp Tyr Ile Gly Phe Leu Thr Leu Ile Leu Ser Ser Phe Leu Val Tyr Leu Val Glu Lys Asp Val Pro Glu Val Asp Ala Gln Gly Glu Glu Met Lys Glu Glu Phe Glu Thr Tyr Ala Asp Ala Leu Trp Trp Gly Leu Ile Thr Leu Ala Thr Ile Gly Tyr Gly Asp Lys Thr Pro Lys Thr Trp Glu Gly Arg Leu Ile Ala Ala Thr Phe Ser Leu Ile Gly Val Ser Phe Phe Ala Leu Pro Ala Gly Ile Leu Gly Ser Gly Leu Ala Leu Lys Val Gln Glu Gln His Arg Gln Lys His Phe Glu Lys Arg Arg Lys Pro Ala Ala Glu Leu Ile Gln Ala Ala Trp Arg Tyr Tyr Ala Thr Asn Pro Asn Arg Ile Asp Leu Val Ala Thr Trp Arg Phe Tyr Glu Ser Val Val Ser Phe Pro Phe Phe Arg Lys Glu Gln Leu Glu Ala Ala Ser Ser Gln Lys Leu Gly Leu Leu Asp Arg Val Arg Leu Ser Asn Pro Arg Gly Ser Asn Thr Lys Gly Lys Leu Phe Thr Pro Leu Asn Val Asp Ala Ile Glu Glu Ser Pro Ser Lys Glu Pro Lys Pro Val Gly Leu Asn Asn Lys Glu Arg Phe Arg Thr Ala Phe Arg Met Lys Ala Tyr Ala Phe Trp Gln Ser Ser Glu Asp Ala Gly Thr Gly Asp Pro Met Ala Glu Asp Arg Gly Tyr Gly Asn Asp Phe Pro Ile Glu Asp Met Ile

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<211> 142
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<213> Homo Sapiens
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           20
                                25
Phe Ala Arg Lys Pro Asp Val Ala Ser Val Gly Ala Thr Ser Arg Arg
                            40
Phe Leu Gln Ile Leu Arg Met Asp Arg Gly Gly Thr Trp Leu Leu Gly
                        55
Ser His Glu Leu Thr Tyr Ile Gly Phe Leu Leu Ile Ser Val Tyr Leu
                    70
                                        75
Glu Lys Phe Tyr Ala Asp Leu Trp Trp Gly Thr Thr Ile Gly Tyr Gly
                                    90
                                                         95
Asp Lys Pro Thr Trp Gly Phe Ser Phe Phe Ala Leu Pro Ala Gly Ile
            100
                                105
Leu Gly Ser Gly Ala Leu Lys Val Gln Arg Gln Lys His Phe Ala Ala
                            120
Leu Ile Gln Trp Arg Tyr Thr Trp Leu Ser Lys Glu Ala Ile
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gaagaactta tttcagtttg a
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265

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